

1. 3.2 Let  $f(x) = x^2 - 2x$ . Evaluate and simplify the following:

a.  $f(2) = 2^2 - 2(2) = 0$

b.  $f(-3) = (-3)^2 - 2(-3)$   
 $= 9 + 6 = 15$

†

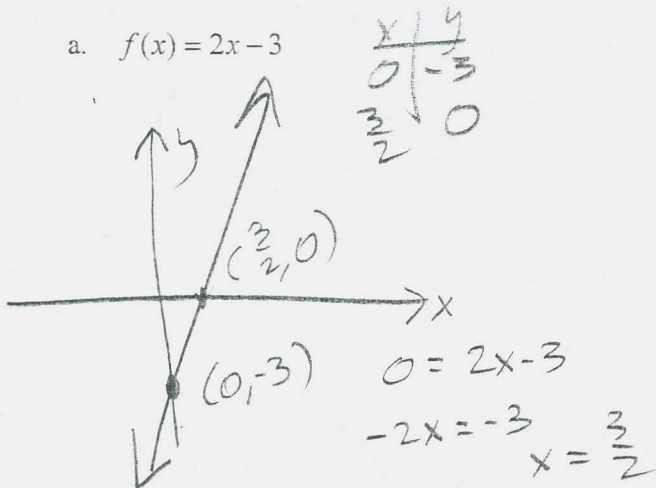
c. Bonus  $f(x+3) =$  STOP!

$$\boxed{(x+3)^2 - 2(x+3)} = x^2 + 6x + 9 - 2x - 6$$

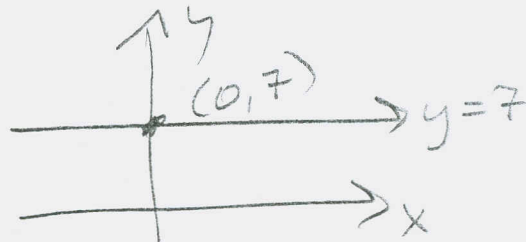
$$= x^2 + 4x + 3$$

2. 3.3 Sketch the graph of each of the following linear functions. Include any x- or y- intercepts, and if the intercepts are *all* you label on your graph, that's just fine with me! BETTER than fine!

a.  $f(x) = 2x - 3$



b.  $f(x) = 7$



3. 3.4 What is the slope of the line  $7x + 2y = 13$ ?

$$2y = -7x + 13$$

$$y = -\frac{7}{2}x + \frac{13}{2}$$

$$m = -\frac{7}{2}$$

4. 3.5 Find an equation of the line through  $(-2, 1)$  and  $(5, -3)$  in *two* ways:

a. Slope-Intercept Method

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3 - 1}{5 - (-2)} = \frac{-4}{7}$$

$$y = mx + b$$

$$1 = -\frac{4}{7}(-2) + b$$

$$7 = 8 + 7b$$

$$-1 = 7b$$

$$-\frac{1}{7} = b$$

$$\boxed{y = -\frac{4}{7}x - \frac{1}{7}}$$

b. Point-Slope Method

$$m = -\frac{4}{7}$$

$$y - y_1 = m(x - x_1)$$

$$\boxed{y - 1 = -\frac{4}{7}(x + 2)}$$

$$y = m(x - x_1) + y_1$$

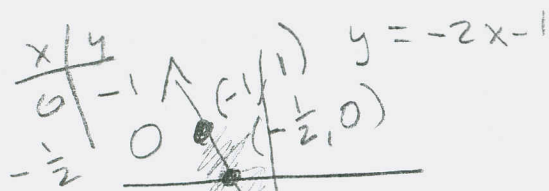
$$y = -\frac{4}{7}(x + 2) + 1$$

5. 3.5 What is the slope of any line that is parallel to the line  $y = 2x - 3$ ?  $m = 2$

What is the slope of any line that is perpendicular to the line  $y = 2x - 3$ ?  $m_{\perp} = -\frac{1}{2}$

On the test, you can expect to be asked to *build the equation* of a line that's perpendicular/parallel, and passes through a particular point. Not much room, here.

6. 3.6 Graph the piecewise-defined function  $f(x) = \begin{cases} -2x-1 & \text{if } x \leq -1 \\ x^2-1 & \text{if } x > -1 \end{cases}$



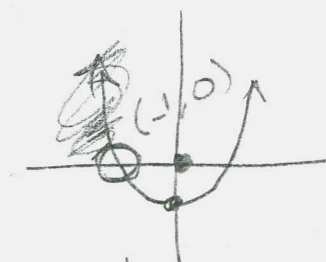
Sutures:

$$x = -1$$

$$y = -2(-1) - 1$$

$$= 2 - 1$$

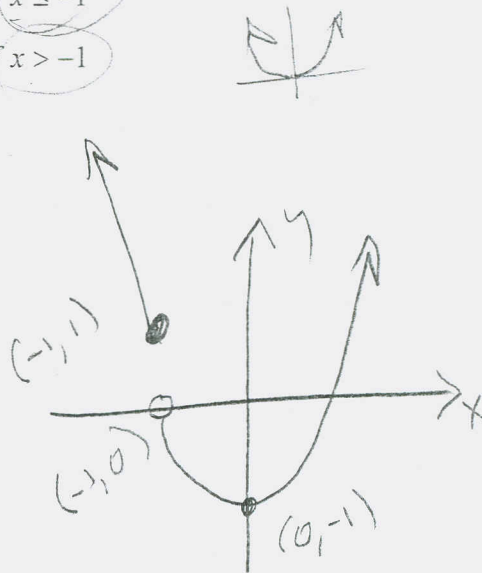
$$= 1$$



$$x = -1$$

$$(-1)^2 - 1 = 0$$

$$x > -1$$



7. Sketch the graph of  $g(x) = \sqrt{2-x} + 3$ , starting with  $f(x) = \sqrt{x}$  as your 1<sup>st</sup> graph, and ending with  $g(x)$  in your final (4<sup>th</sup>) graph.

- $2-x = -(x-2)$
- ✓ ① HORIZ, Reflect
  - ✓ ② HORIZ, shift
  - ③ Vert. reflect
  - ④ Vert. shift

$$g(x) = \sqrt{-(x-2)} + 3$$

↑     ↑     ↑  
FLIP   RIGHT 2   UP 3

